Space Weather Forecast

Issued on Friday 17 January 2025 at 13:30 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Isolated Moderate class flares likely. Chance isolated G1/Minor Geomagnetic Storm, mainly 17-18 Jan.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate activity with isolated Moderate class flares, with the peak flare from a new region in the northwest at 17/0919 UTC. This region rapidly emerged during this period, and has developed magnetic complexity. Slow growth has also been observed in a moderately complex region in the southeast which also exhibits signs of magnetic complexity. The largest region on the disc, in the northeast, showed some slight decline in size through the period and has a simple magnetic structure. The remaining four regions are all smaller and magnetically simple.

No Earth-bound coronal mass ejections (CMEs) were observed in available imagery. One eruptive feature visible on coronagraph imagery from around 16/2200 UTC is yet to be modelled by Enlil and may have produced a CME with a slight Earth-bound component, although this is considered low confidence.

Solar Wind / Geomagnetic Activity: Ongoing fast wind influence was observed attributed to coronal hole influence. Solar wind speeds were initially slightly elevated at 400-430 km/s. Wind speeds remained steady, before gradually increasing from around 17/0400 UTC and are now at Elevated levels around 530 km/s. The strength of the solar wind's magnetic field was Weak, rising to Moderate around 16/2200 UTC. The north-south component of the magnetic field fluctuated Weakly until around 16/2300 UTC, but has since fluctuated Moderately. Geomagnetic activity was mainly Quiet to Unsettled, but with one Active interval 16/1800-2100 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is expected, with isolated Moderate class flares likely. There is a slight chance of a Strong flare, most likely emanating from one of the two aforementioned complex regions in the northwest and southeast of the disc.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. Ongoing coronal hole influence is expected, predominantly from a very elongated coronal hole that stretches out across the solar equator. The associated enhanced solar winds, at Elevated levels, are expected to persist

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for the rest of the period, perhaps peaking around 600 km/s. Wind speeds are expected to begin to wane through Day 4 (20 Jan) towards Slightly Elevated levels. Quiet to Unsettled (Kp 2-3) geomagnetic activity is expected with isolated Active (Kp 4) intervals. There is a chance of reaching a G1/Minor Geomagnetic Storm interval, most likely during Days 1-2 (17-18 Jan).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at background with no Solar Radiation Storms occurring.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	40	40	20	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	60	60	50	50
Very Active	R3-R5 (X Class)	No	10	10	10	10

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	5	5	10	10
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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